



Australian
National
University



ANU CLIMATE HIGHLIGHTS 2018

Message from the Climate Change Institute Director

2018 was a year of extreme events, with drought affecting much of eastern Australia, fires raging in Queensland and California, multiple heat records broken over the course of a particularly hot Northern Hemisphere summer and continued heatwaves here in Australia. As we witness the mounting impacts of climate change, bringing different disciplines together to develop innovative solutions has never been more important.

In 2018, Climate Change Institute (CCI) members from different corners of ANU have worked together on numerous projects. One major area of focus has been developing research on removing greenhouse gases from the atmosphere, an approach known as 'negative emissions'. This has centred on the areas of land based technologies, the development of the concept of a negative emissions house and the public acceptance of negative emissions technologies. We're also developing research aimed at transforming the ability of Australians and our regional partners to adapt to climate change, with particular emphasis on improving capacity for effective decision-making. We'll be continuing to progress these directions and many more in 2019.

As part of our mission to connect ANU climate research with government, industry and the wider community, we have run a full and diverse program of 23 public lectures, seminars and roundtables covering everything from explaining the implications of the UN climate talks to engaging students with ACT climate policy.

Media coverage of ANU climate researchers has continued to grow reaching an audience of over 33 million people, with a highlight being commentary on the launch of the Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming of 1.5C. In fact, six CCI members now have leadership roles with the IPCC, including my own role as a Vice-Chair, whilst numerous others work many hours as expert reviewers on various IPCC reports.

In 2019, with a Federal election scheduled, the CCI will be aiming to continue to inform policymakers and government agencies via briefings and provision of the latest research findings on climate change.

This flyer covers only a fraction of what we're working on – please visit climate.anu.edu.au/2018-highlights to find out more.

Prof Mark Howden

Director of the ANU Climate Change Institute

ANU Climate Change Institute

BUILDING OUR COMMUNITY OF CLIMATE RESEARCHERS & TEACHERS



278

Climate Change
Institute Members



7

out of 7 ANU Colleges



24

out of 27 ANU schools



231

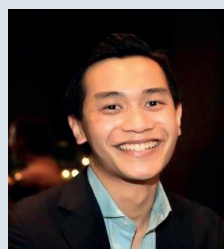
full members and 47
PhD student members

A new CCI Advisory Board was established in 2018 with representatives from 10 ANU schools



Front row from left – Dr Hedda Ransan-Cooper (College of Engineering & Computer Science), Dr Aparna Lal (Research School of Population Health), Clare de Castella (CCI), Rachel England (PhD rep), Assoc Prof Nerilie Abram (Research School of Earth Sciences). Back row from left – Dr Steve Crimp (CCI), Prof Justin Borevitz (Research School of Biology), Prof Mark Howden (CCI), Dr Roslyn Prinsley (Office of Deputy Vice Chancellor, Research & Innovation), Prof Jamie Pittcock (Fenner School of Environment & Society), Dr Will Grant (National Centre for Public Awareness of Science). Other members not pictured above are Prof Sharon Friel (School of Regulation and Global Governance), Prof Frank Jotzo (Crawford School of Public Policy), Prof Andrew MacIntosh (College of Law), Dr Rebecca Colvin (CCI) and Juliet Meyer (CCI).

CCI Member Profile – Aaron Tang



Aaron Tang is a PhD student focused on the international politics and environmental governance of carbon dioxide removal from the atmosphere.

“My work is largely about the future – many negative emissions technologies are still theoretical and don’t exist yet,” he said. “It’s

a matter of understanding the problems broadly from many different perspectives and synthesising those perspectives to try to figure out what we can do in the future.”

Aaron has found the interdisciplinary nature of the CCI has helped him immensely. “I’m in the business of understanding people. I can’t do that from the perspective of politics or economics or sociology alone, so the guidance and networks that the CCI have given me are fantastic.”

CCI Member Breakfast



CCI Members’ breakfast with Katharine Murphy, Political Editor of the Guardian, discussed disruption in the media & how this affected climate researchers’ ability to communicate their key messages.

RESEARCH HIGHLIGHTS

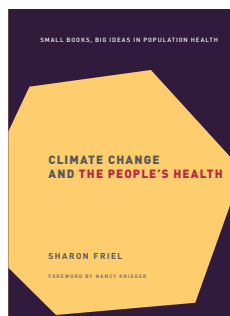
The CCI brings together cutting-edge climate research – from fundamental climate science and its effects on our biophysical environment to societal, economic, political, legal and technological impacts and responses. This year eight of the top ten ANU highly cited researchers were CCI members, demonstrating the influence of ANU climate research.



RESEARCH HIGHLIGHTS

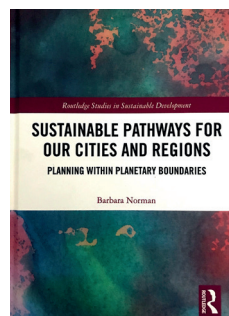
Below is a small sample (far from comprehensive) which demonstrates the breadth of climate change research by CCI members in 2018, and you can read more at climate.anu.edu.au/research.

New books in 2018



Climate Change and the People's Health

by Prof Sharon Friel, Director, ANU School of Regulation and Global Governance (Regnet)



Sustainable Pathways for our Cities and Regions

by Prof Barbara Norman, Adjunct Professor at CCI

ANU ranked a global research leader on mechanisms for reducing greenhouse gas emissions

A new study ranks ANU amongst the five most productive research institutions globally on market mechanisms for carbon emission reductions between 1992-2016.

Market mechanisms, such as emissions trading schemes and carbon taxes, are increasingly being used in the battle to fight climate change around the world.

This ranking recognises the breadth and depth of expertise in climate economics and policy at ANU, with numerous ANU researchers collaborating and a strong history of work in this field.

The high rates of citations of many ANU papers show that the research has been globally influential within the research community. These strong foundations have allowed the research

to be scaled up and applied in a policy context, with the research informing policy making in Australia, China, the US and elsewhere.

The tradition of this research dates back to analysis by Prof Warwick McKibbin (Crawford School of Public Policy) as well as highly cited papers by Dr Jack Pezzey (Fenner School of Environment and Society), Prof Frank Jotzo (also Crawford School) and various other ANU researchers and affiliates.



Designing a house that absorbs carbon dioxide

To limit global warming to below 2°C, we must not just stop burning fossil fuels, we must also draw down atmospheric CO₂ and store it safely (an approach known as negative emissions). By 2050, over a billion new dwellings will be needed globally due to population increase, rural-to-urban shifts and migration, mostly in the developing world.

CCI members are working on the concept of a negative emissions house that draws down CO₂ and is a net producer of energy.

“This research is really exciting because it provides an opportunity to solve lots of dilemmas at the same time with transformational effect”, said Dr Bec Colvin, Knowledge Exchange Specialist with CCI.

“It helps tackle climate change, it turns a waste stream (CO₂) into a useful commodity, it transforms housing from being a major CO₂ emitter to a CO₂ sink and it helps provide relatively low cost housing for our growing population” said Dr Zongyou Yin of the Research School of Chemistry.

The project uses two key methodological innovations. It aims to convert CO₂ to polymer-based building materials, which will be used in various ways in the house. Secondly, researchers are collaborating with industry to engineer new CO₂-absorbing cements. ANU are well positioned for this type of research and we are currently seeking new and additional funding streams.

The negative emissions house would tackle two globally critical challenges: the need for over a billion houses over the next three decades and the need to avoid dangerous climate change.



RESEARCH HIGHLIGHTS

How can we make our cities more climate friendly?

It's often said that the sustainability battle will be won or lost in our cities. One researcher who's working all out to win this battle is Prof Xuemei Bai of the ANU Fenner School of Environment & Society.

Increasing urbanisation is one of the biggest social transformations in the world, with enormous social, economic and environmental impacts.

About 75% of CO₂ emissions from final energy use can currently be attributed to cities and this share is likely to grow as urbanisation intensifies.

"Cities are increasingly feeling the effects of extreme weather," she said. "Many of them are particularly vulnerable as they're located on the coast, on flood plains or in dry areas. So they must waste no time in taking action to address climate change."

She emphasises the need to take a systems approach. "It doesn't make sense to look at preventing climate change (mitigation) and adapting to climate change separately," she said. "Sometimes there can be trade-offs and sometimes synergies, but it's important to treat cities as a system and look

at them together. Similarly we need to look at cities in terms of both the challenges and the solutions."

"Many cities are more advanced in taking action on climate change than their national governments, but there are also limitations to what cities can do alone. It's really important for national governments to work together with cities in addressing climate change."

Prof Xuemei Bai was awarded the prestigious Volvo Environment Prize in October 2018



Helping reduce hunger in rural Papua New Guinea

In 2015 a major drought, followed by a significant frost, in the Eastern Highlands of Papua New Guinea (PNG) led to food stress for much of the population. Dr Steve Crimp's research is designed to help communities respond directly to this type of crisis.

"My research looks at how to improve the flow of climate information into rural communities in forms that those communities can respond to," said Dr Crimp, a Research Fellow at the CCI. "Climate science can generate a lot of information but its usefulness depends on how it can be understood by local communities."

For example, if a drought is highly likely, instead of providing probabilistic statements of rainfall, the government could communicate guidelines about farming practices such as recommending which crops to focus on.

PNG Highlands children with one of the weather stations used in the research

"This research is likely to have significant economic benefits for PNG. When communities use information effectively, we can reduce food production losses and increase production gains in a way that improves the overall livelihood of rural PNG communities."



Who will take the lead on global climate action?

Since the election of President Trump and the announcement that the US will withdraw from the Paris Climate Agreement, there has been an opportunity for other countries to take a leadership position on climate change. This year, Dr Christian Downie of ANU School of Regulation and Global Governance published research looking at the role that Brazil, Russia, India, China and South Africa (known as BRICS) could take in global climate governance.

"This research is useful because it analyses where BRICS could scale up their co-operation, particularly around energy efficiency, agriculture and development finance," said Dr Downie. "BRICS policymakers need to overcome significant differences in their interests in order to collaborate, which is why these three areas are so important."



Read more about this research and much more at climate.anu.edu.au/research-2018

ANU CONTRIBUTIONS TO THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC)



6

**leadership roles
with IPCC**



2.3m

**ANU expert commentary
reached more than
2.3 million people**



14+

**briefings, roundtables
& lectures on IPCC
1.5°C report**



Numerous

**ANU expert reviewers
for IPCC**

Leadership roles with the IPCC

This year, the IPCC has appointed three ANU climate experts as lead authors for the Sixth Assessment Report, which will be published in 2022:

- > Prof Frank Jotzo, Lead author on *National and Sub-national Policies and Institutions*
- > Prof Xuemei Bai, Lead author on *Urban Systems and Other Settlements*
- > Dr Kathryn Bowen, Lead author on *Health, Wellbeing and the Changing Structure of Communities*

These authors join three existing ANU contributors to the IPCC:

- > Prof Nerilie Abram, Convening Lead Author on *IPCC Special Report on Oceans and Cryosphere*
- > Emeritus Prof Ian Noble, Review Editor on *IPCC Special Report on Land*
- > Prof Mark Howden is Vice-Chair of IPCC Working Group 2 & has numerous IPCC responsibilities

A seventh lead author, Dr Joelle Gergis, will be joining ANU in March 2019.

Prof Howden plays a particularly strong role across many different parts of the IPCC, including helping steer the Special Report for Climate Change and Land, various Assessment Reports, re-framing the approach to risk in the IPCC and as a Review Editor on the chapter on *Strengthening and implementing the global response*.



Launch of IPCC 1.5°C Special Report on Global Warming – Oct 2018

The CCI, notably Prof Mark Howden, have been instrumental in communicating the findings and implications of the report:

- > Media coverage by ANU commentators reached an audience of over 2.3 million people
- > Three targeted ministerial / parliamentary briefings
- > Roundtable discussion attended by 30 policymakers and researchers
- > Six lectures on report's findings attended by approx 1450 people
- > Targeted presentations to several government agencies

The CCI's public lecture on "IPCC special report on Global Warming of 1.5C: Deciphering the implications for emission-reduction and climate adaptation" played to a booked out crowd.



'We're not on track': Major climate change report pushes for 1.5°C cap,

SBS News, 8 Oct 2018



Why you should care about half a degree of global warming,

ABC Triple J Hack, 8 Oct 2018



Coal is on the way out, the only question is how quickly,

Sydney Morning Herald opinion piece by Prof Mark Howden & Prof Frank Jotzo, 10 Oct 2018



Read more at climate.anu.edu.au/publicpolicy-2018

EDUCATION HIGHLIGHTS



117

climate courses
across ANU



60

undergraduate courses



89

postgraduate courses



4

interdisciplinary climate
PhD scholarships

Climate education across ANU

ANU runs over 60 undergraduate and 89 postgraduate courses that address the multiple dimensions of climate change, from climate science to economics, law, policy and governance aspects of climate change vulnerability, adaptation and mitigation.

Master of Climate Change

Climate change is one of the most important and complex problems encountered by humankind. As its impacts become more and more apparent, people who understand its multiple dimensions and can contribute to developing, communicating and implementing innovative solutions are in increasingly high demand.



Turning a passion into a career

"I knew I really cared about climate change but I didn't know which aspect I wanted to focus on. I chose the Master of Climate Change because it touches on all aspects of climate change, and also gives all students the chance to focus on their areas of interest. It's the best climate Master's program in the world. I've received phenomenal support from the course convenors – not just by helping with coursework but also by helping me develop my career."

Master of Climate Change student, Caitlin Sears, has recently landed her dream job with ARENA.

PhD supplementary scholarships

Climate change is a challenge which transcends traditional disciplinary boundaries. Identifying and implementing solutions demands a perspective which can integrate insights from many different domains. In 2017, the CCI established a PhD scholarship to encourage this integrative approach – we're delighted to highlight two of the 2018 recipients:



Understanding societal attitudes to climate change and carbon dioxide removal

Yuanyuan Shang,
National Centre for Public Awareness of Science

"I'm aiming to understand the context, framing, communication gaps and discussion on negative emissions, to assist the technologies in moving from pilot-scale theory to scaled-up practice."



Who'll pay for the losses and damages caused by climate change?

Melanie Pill,
Fenner School of Environment & Society

"The end goal is to create a holistic framework that covers financing of all aspects of loss and damage and that can be adopted internationally."

Climate change short professional courses for government departments

The CCI regularly delivers short professional courses on recent advances in climate science and the social, policy, economic and governance aspects of climate change for policymakers and professionals.

Read more at climate.anu.edu.au/education-2018

EVENTS

Here are some examples showing the diversity of our 2018 events:



ANU Climate Update 2018

Sydney and Brisbane - An overview of how our climate is changing and how we're responding to those changes, incorporating a snapshot of newly released climate data, commentary on policy responses and discussion of corporate responses. Both events were heavily oversubscribed.



Climate and Growth: An OECD perspective on the future we need

Can we have strong climate action and robust economic growth at the same time? The Organisation for Economic Co-operation and Development (OECD) report, *Investing in Climate, Investing in Growth*, lays out the economic case for integrating climate policy into the heart of mainstream economic policy.



Climate Café: How can music encourage people to engage on climate change?

Why and how is music such a potent tool for communication and adaptation in The Gambia? Participants discussed the role of music in climate change communication and adaptation. How can music and the arts be used to overcome blockages to climate action?

IN THE MEDIA

The media is a vital channel for communicating ANU climate research to the broader community. Climate researchers across ANU engage with media on a daily basis.

In 2018:



973

media articles / programs featuring just a few of CCI's key contributors



33.1m

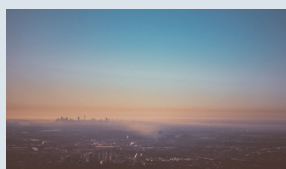
We reached an audience of more than 33.1 million people



\$20.7m

Advertising value of over \$20.7 million

Here are a few examples of 2018 media coverage:



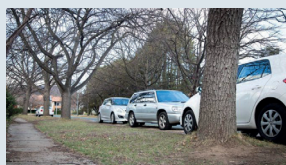
Clearing the air: who should do the most to tackle climate change?

Prof Frank Jotzo, Sydney Morning Herald, 4 Aug 2018



Australia's drought could cause a spike in gastro cases

Dr Aparna Lal, SBS News, 11 Oct 2018



Street trees set to weather threats of climate change and heated suburban warfare

Assoc Prof Cris Brack, ABC Radio Canberra, 24 Aug 2018



Panel discussion on fire, climate change and the 'new normal' on Channel 7, Weekend Sunrise

with Prof Mark Howden, 1 Dec 2018

CONNECT WITH THE ANU CLIMATE CHANGE INSTITUTE



Visit our website at:
climate.anu.edu.au



Email us at:
climate@anu.edu.au



Like us on Facebook:
[@ANUClimate](https://www.facebook.com/ANUClimate)



Subscribe:
climate.anu.edu.au/climate-change-institute-subscription-form



Call us at:
+61 2 6125 6611



Follow us on Twitter:
[@ANU_Climate](https://twitter.com/ANU_Climate)